

## **An Extrinsic Optical Fiber Bending Sensor: A Theoretical Investigation and Validation**

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### **ABSTRACT**

This paper presents the theoretical investigation and experimental validation of an extrinsic optical fiber bending sensor based on intensity modulation with automatic compensation. The proposed optical fiber bending sensor can measure continuous bending movement in flexion, extension, and lateral directions, simultaneously. The theoretical study is significant in choosing the most suitable parameter values for the sensor so that its sensitivity and working range are applicable for spine monitoring application. The fabricated bending sensor also shows a minimum signal fluctuation due to temperature effect.

**KEYWORDS:** Bending sensor, intensity modulation sensor, human spine monitoring.

**DOI: 10.1109/JSEN.2015.2436898**